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Landers

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[54] **ROLLER ADJUSTMENT MEANS FOR IN LINE SKATE**

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[51] **Int. Cl.**[5] **A63C 17/06**

[52] **U.S. Cl.** **280/11.27**; 280/11.22; 280/43.17

[58] **Field of Search** 280/11.22, 11.23, 11.27, 280/11.19, 7.13, 841, 43, 43.17

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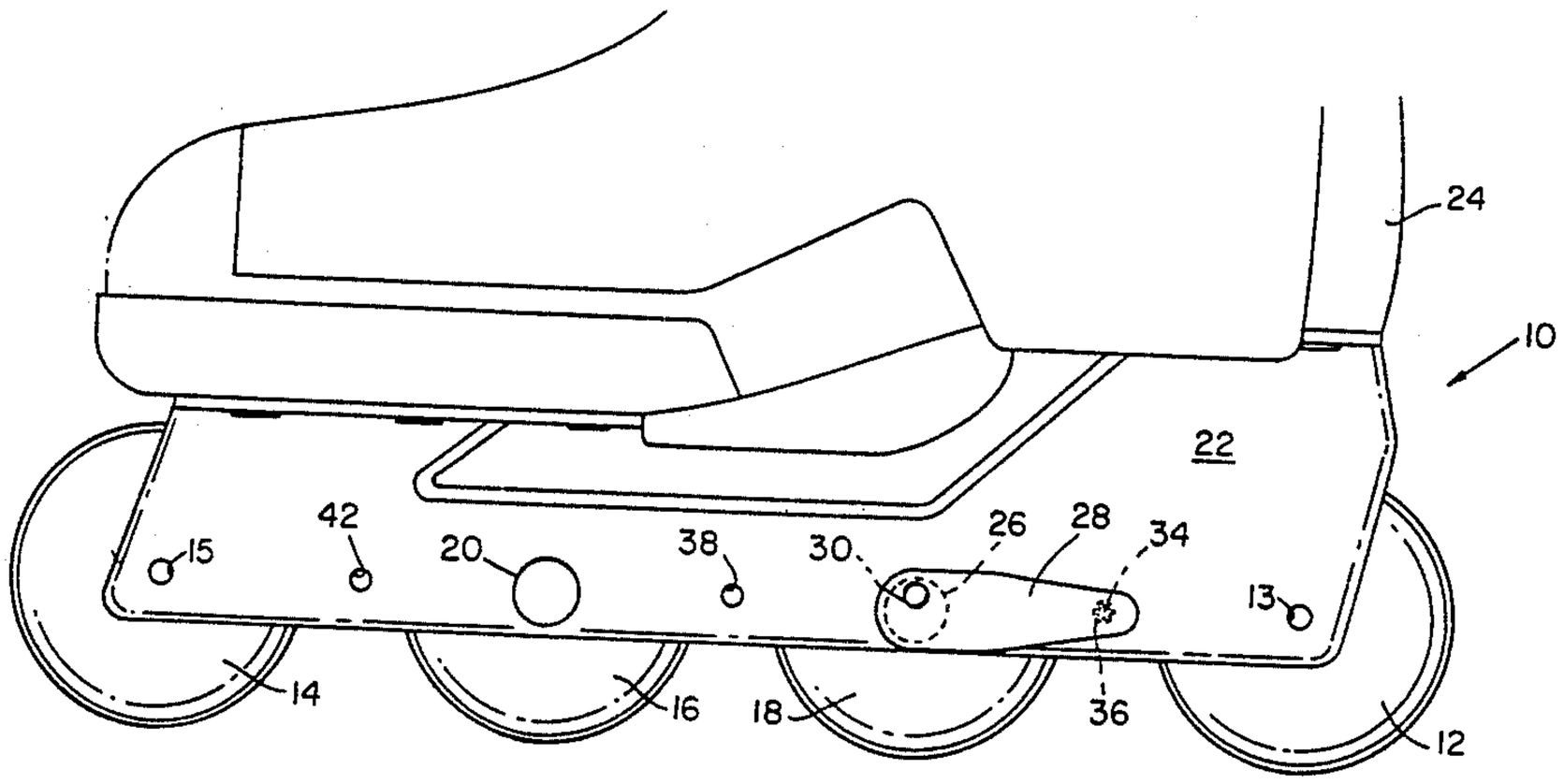
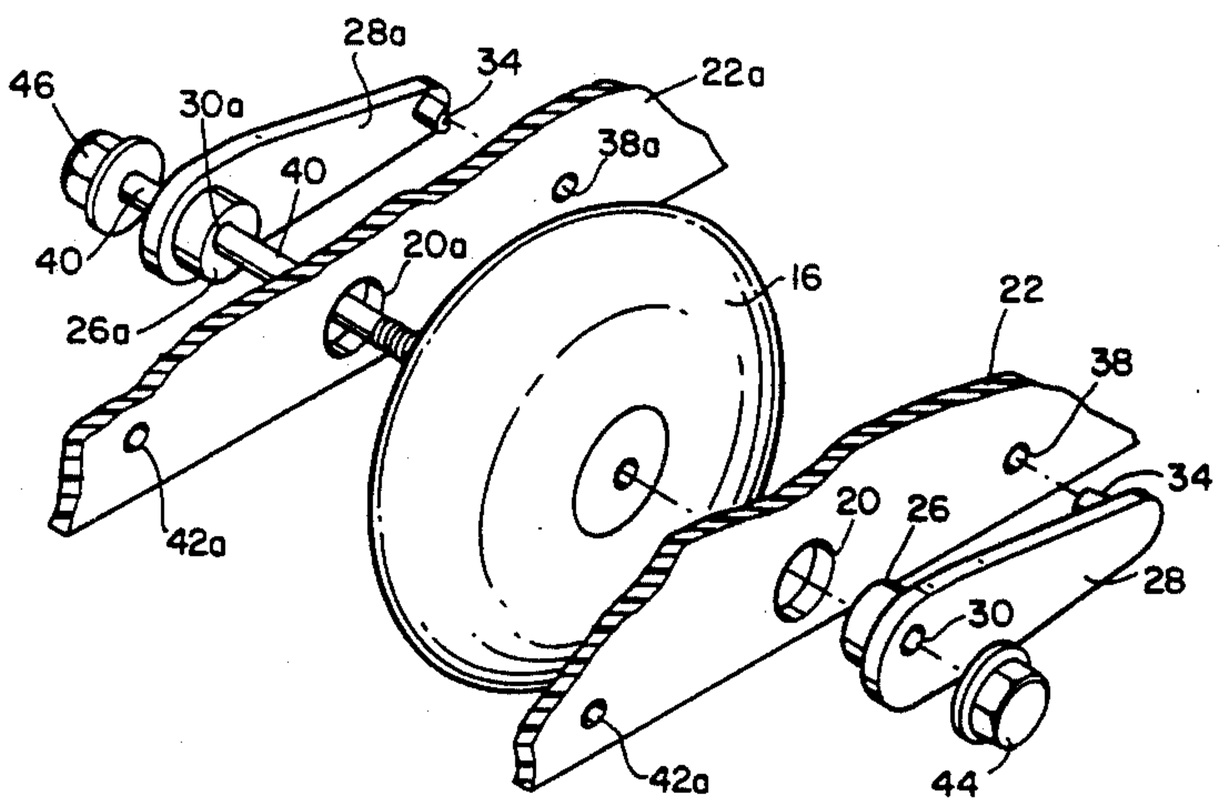
[57] **ABSTRACT**

A lever arrangement is provided to adjust the height of one or more rollers of an in line skate. The lever arrangement is rotatably mounted between an axle for a roller and a bracket for supporting the roller axle and is mounted on both ends of the axle. The axle extends through a rotatable bushing at one end of the lever arrangement having an off-center hole for the axle. A lock is provided at a second end of the lever arrangement.

4 Claims, 3 Drawing Sheets





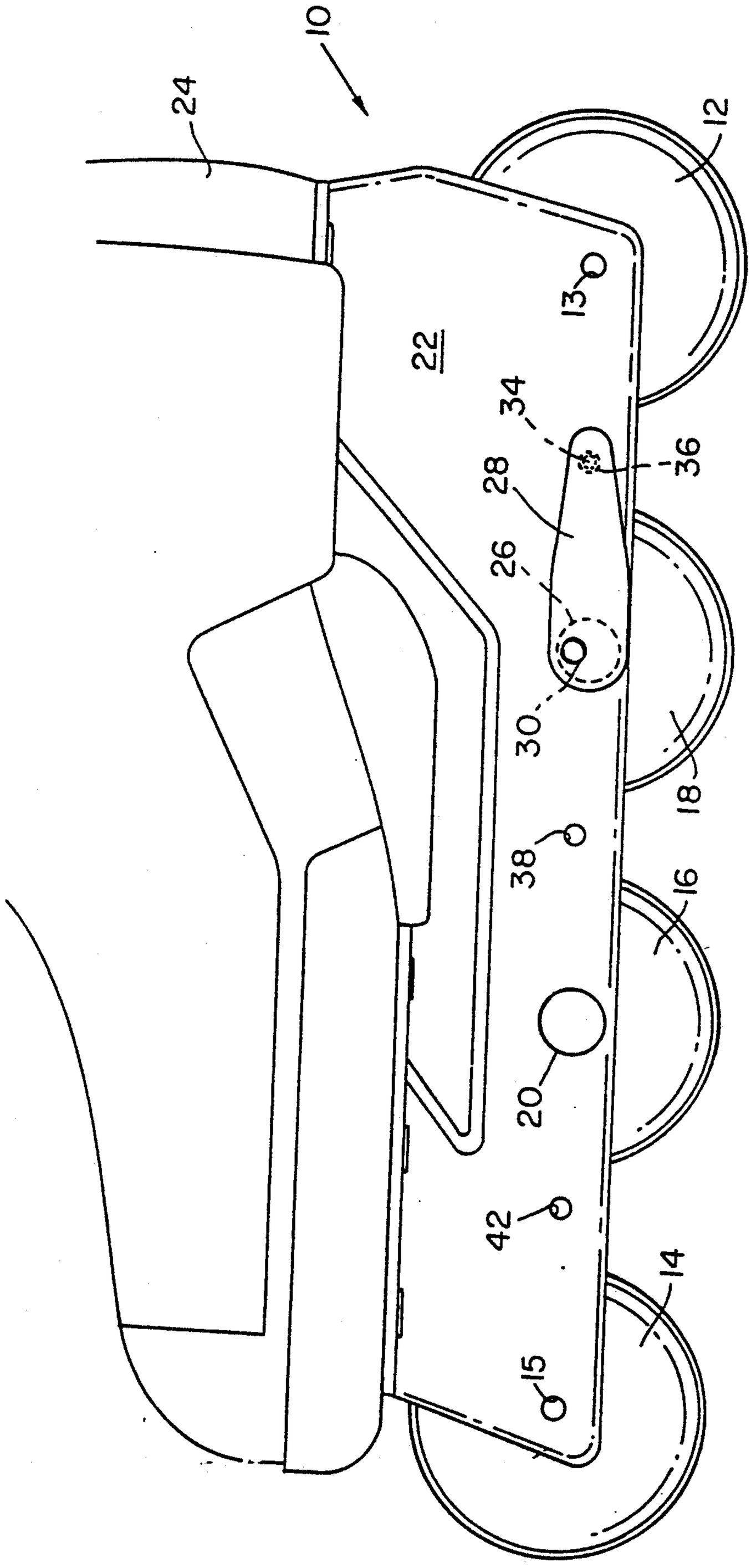


Fig. 1

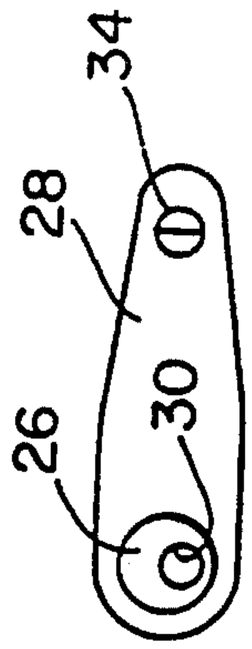


Fig. 3

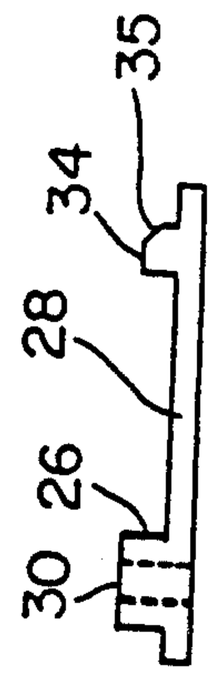


Fig. 2

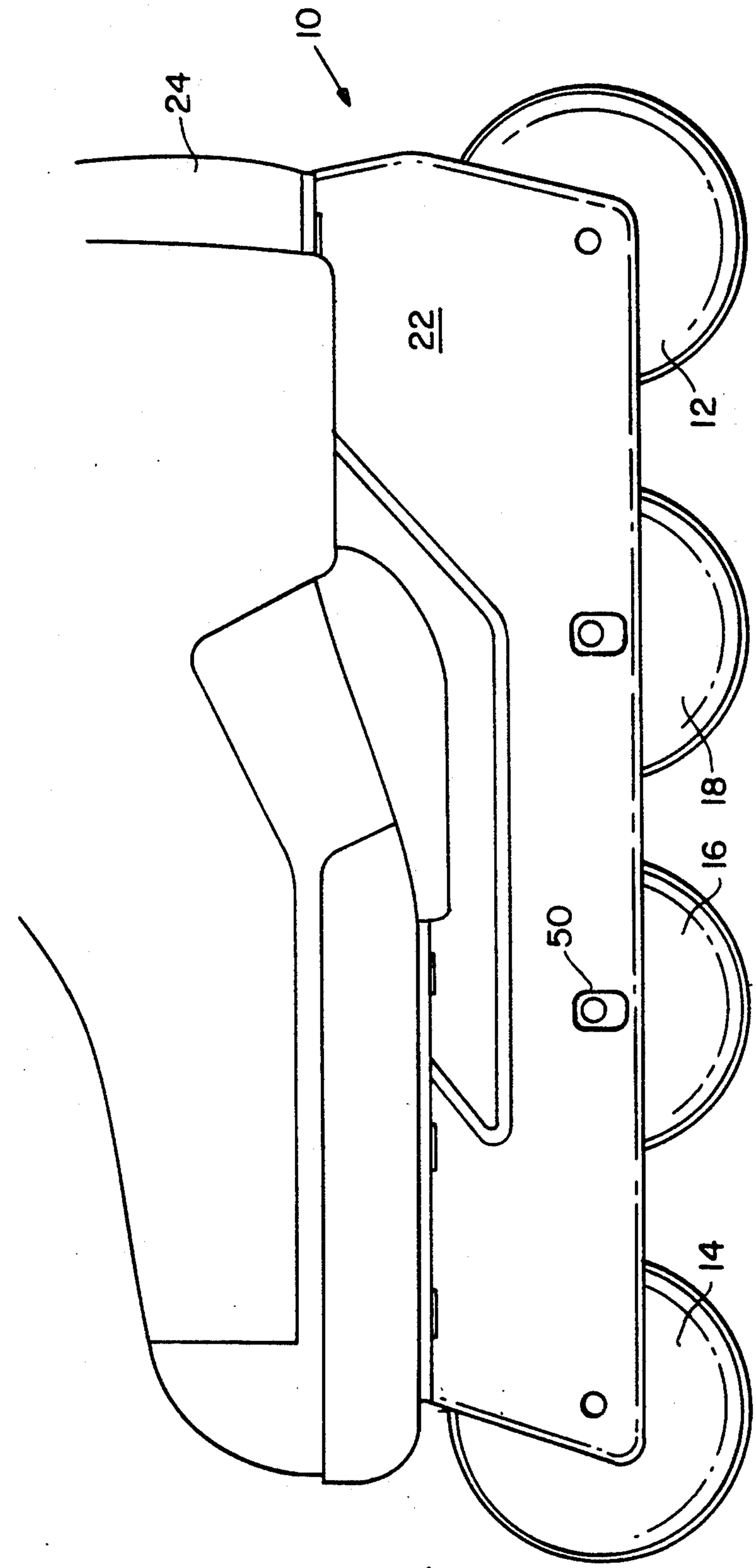


Fig. 4
PRIOR ART

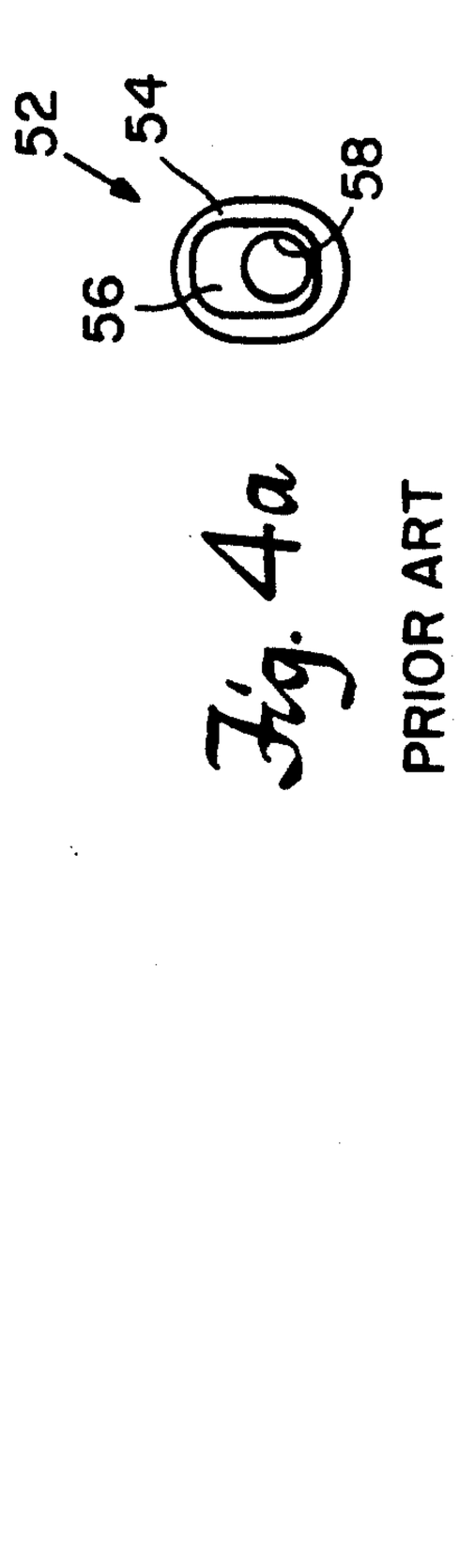


Fig. 4a
PRIOR ART

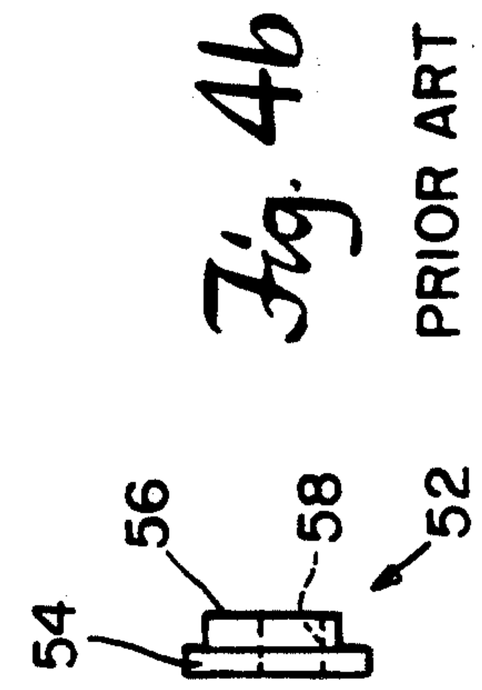


Fig. 4b
PRIOR ART

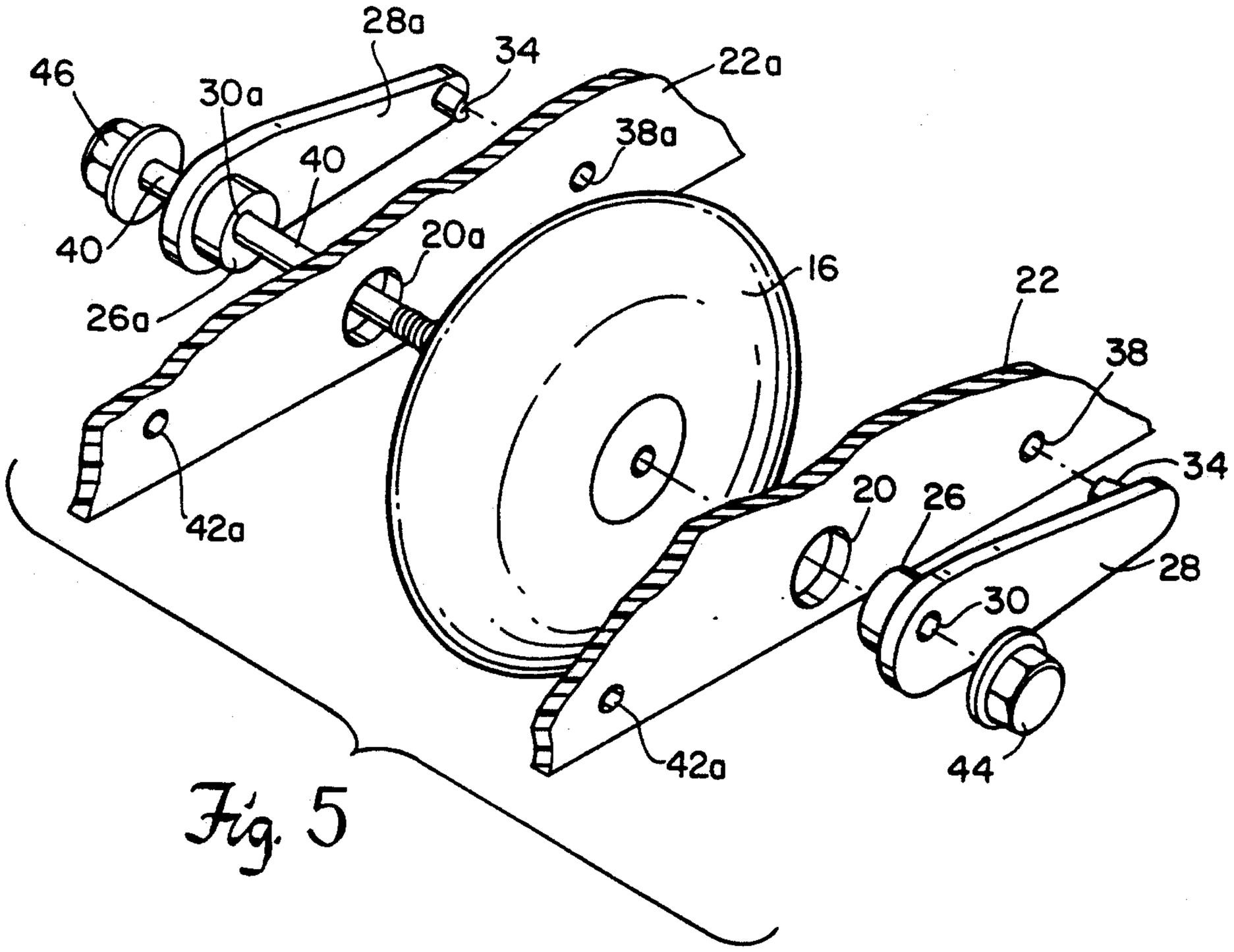


Fig. 5

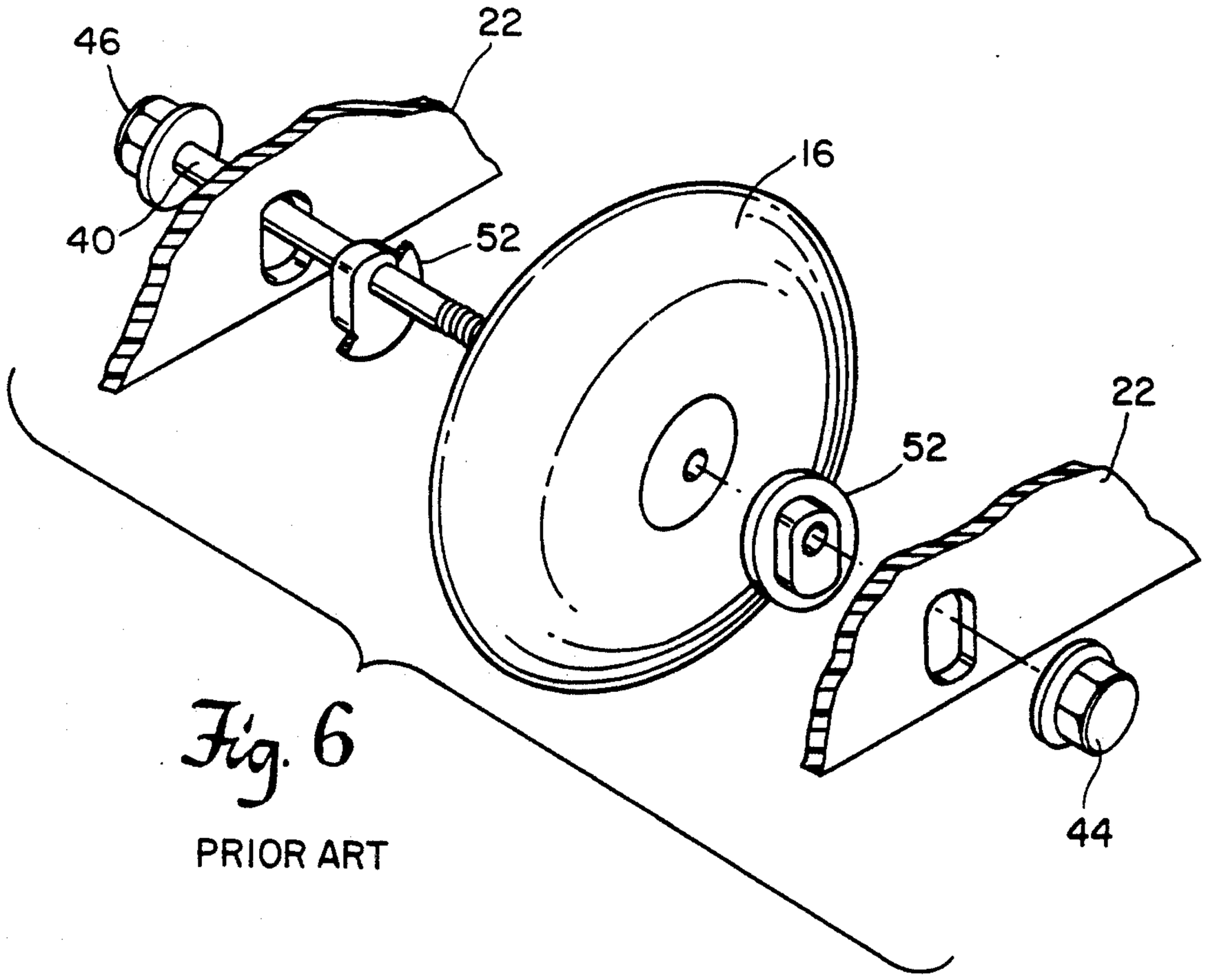


Fig. 6

PRIOR ART

ROLLER ADJUSTMENT MEANS FOR IN LINE SKATE

BACKGROUND OF THE INVENTION

This invention relates to a means for adjusting the height of one or more rollers of an in line skate.

At the present time recreational in line skates are available which have a boot section adapted to fit over the foot of a user and rollers attached to the boot section. The rollers are aligned in one row rather than two rows as has been the roller arrangement for roller skates. The use of in line skates is able to achieve speeds in excess of about 30 miles per hour on a flat surface which speeds are much faster than can be achieved by the user with a conventional (or non-tandem wheeled) roller skates. These high speeds are achieved when the axles supporting the rollers are positioned at the same height so that all rollers contact the ground. In an alternative mode of use, one or more internal rollers in the line of rollers are lowered by lowering the axles for the rollers. When the rollers are in this position, the skater is able to execute quick turns to quickly change the direction of his movement.

At the present time a height adjustment mechanism is provided for roller axles for in line skates which is secured to a bracket for the roller axles, which, in turn, is secured to the boot section of the in line skate. The mechanism comprises a fixed bushing having a non-circular shape which fits into a mating hole extending through the bracket. The fixed bushing has an ellipsoidal boss which is inserted through the bracket. The fixed bushing has a hole extending through it which accomodates an axle for the roller. The fixed bushing can be removed by hand from the bracket, rotated to a second position and reinserted into the bracket hole in order to fix it within the bracket in this second position. When in the second position, the axle hole through the bushing is positioned at a different height than the height of the axle in its original position. By operating in this manner, it is possible to adjust the height of the roller axles and the roller. This axle height adjustment system is undesirable since it requires the skater to remove the wheel and axle from the skate in order to reposition the stationery bushing. This procedure is time consuming and requires the use of special tools. In addition, the separated parts are small and can be easily lost.

Accordingly, it would be desirable to provide a means for adjusting the height of roller axles for in line skates which can be practiced quickly by hand without the need for disassembling any part of the skate and without the need for special tools.

SUMMARY OF THE INVENTION

The present invention provides a system for adjusting the height of an axle for a roller for in line skates. The system comprises a rotatable bushing fixed to a handle or lever. At one end of the handle means for locking the rotatable bushing to a desired position is provided. The rotatable bushing is provided with a hole which is positioned off center from the center of rotation of the rotatable bushing. The rotatable bushing is positioned in a circular hole in a bracket which, in turn, supports the axles of the skate rollers. A roller axle extends through the hole in the rotatable bushing. The height of the hole in the rotatable bushing is changed by rotating the rotatable bushing and the height is fixed by locking means in

position. A rotatable bushing is positioned at both end portions on the axle. The height adjustment system can be utilized on one or more roller axles.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side view of an in line skate with the roller axle height adjustment means of this invention.

FIG. **2** is a top view of the height adjustment means shown in FIG. **1**.

FIG. **3** is a side view of the height adjustment means shown in FIG. **2**.

FIG. **4** is a side view of an in line skate of the prior art.

FIG. **4***a* and **4***b* show the fixed bushing of the prior art.

FIG. **5** is an exploded view of the height adjustment means of this invention wherein nut **44** has been omitted for clarity.

FIG. **6** is an exploded view of the height adjustment means of the prior art.

DESCRIPTION OF SPECIFIC EMBODIMENTS

The roller axle height adjustment means of this invention utilizes a rotatable bushing having a hole through which a skate roller axle extends. A rotatable bushing is provided at each end section of an axle. A handle is formed integrally with the roller bushing. The handle includes a locking means which functions to lock the rotatable bushing in place after it has been rotated to a desired position. The handle also provides a means for rotating the rotatable bushing by hand without the need for removing or loosening the rotatable bushing from position in a skate bracket which also supports the roller axle. The roller axle is positioned through the through hole so that the axle is supported by the rotatable bushing which, in turn, is supported by the bracket. The through hole is positioned off center from the center of rotation of the rotatable bushing. The locking means is positioned in a plurality of locking positions which, in turn, causes the through hole to be positioned in one of a plurality of different vertical heights.

In use, both rotatable bushings are rotated to the same desired position simultaneously in order to position the through holes in each bushing at the same vertical height. This is effected manually by grasping a handle intergrally formed with the rotatable bushing and rotating the handle. The handle then is locked in place by means including the bracket which supports the roller axles of the skate. This height adjustment system is used on one or a plurality of roller axles and which are normally positioned on one or more intermediate axles in the line of roller axles on the skate. This height adjustment can be effected by hand without the need for special tools and without the need for disassembling or loosening any portion of the skate.

Referring to FIG. **1–3**, the in line skate **10** comprises a plurality of rollers including end rollers **12** and **14** and intermediate rollers **16** and **18**. Rollers **16** and **18** are provided with roller axle height adjustment means of this invention. With rollers **16** and **18**, a circular hole **20** is provided in fixed bracket **22** which, in turn, is fixed to boot section **24**. The hole **20** is of a size which permits the circular rotatable bushing **26** to be snugly fit while permitting its rotation within hole **20**. A handle or lever **28** is secured to or formed integrally with bushing **26**. The bushing **26** includes a through hole **30** which extends through handle **28** and is of a size which permits

an axle for the roller **16** or **18** to be passed therethrough. A locking means **34** is positioned on the handle **28**. The hole **30** is positioned off center from the center of rotation of the bushing **26**. The locking means **34** for roller **18** can be positioned in hole **36** or in hole **38** in bracket **22**. More than two holes can be utilized to lock the rotatable bushings in more than two positions, if desired. The holes **20** have centers which are offset downward from the center of holes **13** and **15** which house axles for rollers **12** and **14** so that the rollers **12, 14, 16** and **18** are at the same height at one of the two positions of lever **28**. A locking means associated with a second pair of rotatable bushings **26** for roller **16** can be positioned in hole **38** or hole **42**. The locking means can include a chamfered surface **35** which permits the locking means to be easily inserted into holes **36, 38** or **42**. For convenience, when the handle **28** extends in the same direction, such as when locking means **34** are positioned in holes **36** and **38**, rollers **16** and **18** are at the same height as rollers **12** and **14**. In at least one second position, the rollers **16** and **18** are at different heights than that of rollers **12** and **14**. Other locking means than extension **34** can be used. For example, an end of the lever **28** could be fit into a bracket formed integrally with bracket **22**. All that is needed is that the lever **28** be held in place during use of the skate.

Referring to FIG. **5**, the height adjustment means of this invention are shown in position on an in line skate. The rotatable bushings **26** and **26***a* are positioned on axle **40** which passes through holes **30** and **30***a*. The axle **40** also passes through brackets **22, 22***a* which are positioned on both sides of roller **16**. The axle is secured in place by conventional means such as nuts **44** and **46**. The levers **28** and **28***a* are positioned and locked in place so that the holes **30** and **30***a* are at the same height. For convenience of the user, this is effected when handles **28** and **28***a* extend in the same direction. The rotatable bushings **26** and **26***a* can be rotated in place within bracket **22** without the need for loosening nuts **44** or **46** and without the need for removing axles **40** from bracket **22**.

Referring to FIGS. **4** and **6**, the roller axle height adjustment means of the prior art is shown. The bracket **22** is provided with a noncircular hole **50** such as an elliptical hole as shown. A fixed bushing **52** includes a flange **54** and an elliptical boss **56** which fits in hole **50**. Flange **54** serves to fix the bushing **52** in place in bracket **22**. A through hole **58** is positioned off center from the center of the elliptical boss **56**. Thus, hole **58** can be positioned concentrically or nonconcentrically in relation to rollers **12** and **14** directly relative to which of the two possible positions elliptical boss **56** is in. In order to change the position of fixed bushing **52** (See FIG. **6**), the nuts **44** and **46** must be removed from axle **40** with a suitable tool so that axle **40** can be removed from bracket **22**. The fixed bushings **52** then are removed by hand from the bracket **22**, rotated 180° and then reinserted in bracket **22**. Roller **16** and axle **40** then are repositioned in bracket **22** and the nuts **44** and **46** are secured to the axle with an appropriate tool. In this case as in FIG. **1**, the center of elliptical hole **50** is also offset downwardly with respect to the concentrics of wheels **12** and **14** so that equilateral concentricity is only achievable in one position of **56** or **52**. Thus, the prior art arrangement requires that the roller support structure be completely disassembled and reassembled.

I claim:

1. In combination with an in line skate having a boot, a frame supporting the boot, and a plurality of wheels rotatably mounted on axles supported by the frame, the improvement of a system for adjusting the height of at least one of the axles in relation to the frame, the system comprising

a pair of opposed, coaxially rotatable bushings supported by the frame and each defining a through hole for passing the ends of a wheel axle, the axle-receiving through holes being located eccentrically to the bushings' rotational axis,

securing means coupled to the wheel axle for securing the bushings and axle relative to the frame,

a lever extending radially outwardly form each of the rotatable bushings for receiving a force to rotate the bushings, and

locking means, formed with the frame, for releasably and replaceably receiving a portion of each of the levers to secure the bushings against unwanted rotation.

2. The combination as set forth in claim **1** wherein the system further comprises multiple pairs of opposed, rotatable bushings for adjusting the height of multiple axles in relation to the frame.

3. The combination as set forth in claim **1** wherein the locking means is capable of receiving a portion of the lever in one of two locations.

4. The combination as set forth in claim **3** wherein the locking means comprises a plurality of apertures located in the frame for lockingly receiving the portion of the lever.

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